



## **Special Temporary Authority to Test Radar Instrumentation**

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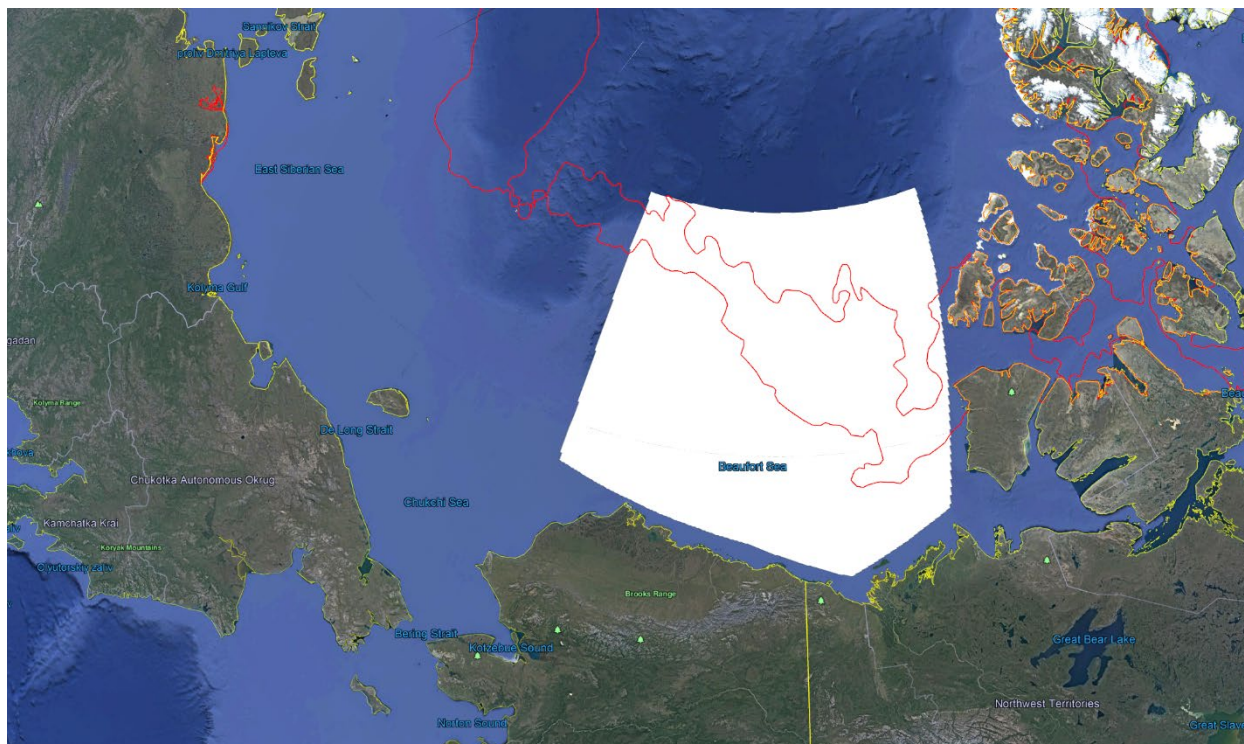
## A. Purpose of Operation and Need for License

The purpose of this experiment is to test the performance of an ultra-wideband radar system for sounding sea ice when operated on board the Vanilla Unmanned VA001 aircraft (<https://vanillaunmanned.com/>). The radar system will transmit a waveform in the S and C bands, with its antennas looking towards the nadir direction. This work is funded through a grant from NASA to study sea ice in the Arctic. A concurrent request is being filed with the FAA for the platform by the owners of the Vanilla, Platform Aerospace.



## B. Locations of Proposed Operation

**Proposed Locations:** Measurements will be conducted off shore of Deadhorse, Alaska. General area proposed for test flights are located in the white bounding box below.



**Dates:** Final dates to be determined due to schedule impacts of COVID-19. We are requesting a window of March to September 2021

## C. Technical Specifications

### 1. Frequency of Operation

CRSIS requests authorization to operate in the 2-8 GHz bands.

### 2. Effective Radiated Power (ERP)

The effective radiated power (ERP) will not exceed 100 W (ERP in Watts units); 20 dBw (ERP in dBw units)

### 3. Modulation Signal Description and Emissions

The system is a frequency modulated continuous wave radar that emits a 2-8 GHz chirp. The chirp duration is 200  $\mu\text{s}$  and the pulse repetition frequency is 5 kHz. The primary emission designator is 6G00G3N.

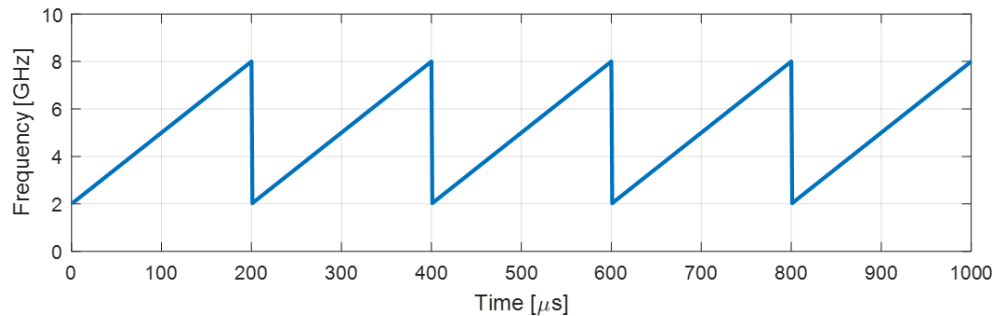


Fig. 1 – Modulation Signal (Ramp) for the Snow Radar

The FMCW Radar sweeps +/- 3GHz from the Carrier (5 GHz). The sweep duration is 200 microseconds. The repetition rate is 5 kHz.  $B_d = 3 \text{ GHz}$   $B_n = 2 B_d = 6 \text{ GHz}$

### 4. Antenna Information

The antenna used are directive horn antennas Model 3115 by ETS- Lindgren and mounted on the wings of the UAV with a gain of 20 dBi. The Antennas are nadir pointing with a beamwidth (along track and cross track) of 50 degrees and 50 degrees.

### 5. Equipment Utilized

The Radar equipment used for this system is custom built at the Center for Remote Sensing of Ice Sheets at the University of Kansas.

### 6. Station Class

This station will be Aeronautical Mobile in the area described in section B with a nominal altitude of 1500-4500 feet AGL.

## E. Contact Information

For questions about this application or in the unlikely event interference concerns should arise, please contact:

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